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Draft Environmental Analysis Record

E.A.R. No. 27-050-6-6
for

Beaver Dam Habitat Management Plan

June, 1975

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MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

1791
N5-WHA-T24
(N-057)

TO : District Manager, Las Vegas

DATE:
September 25, 1975

FROM : Area Manager, Caliente-Virgin Valley Resource Area

SUBJECT: E.A.R. for Beaver Dam Habitat Management Plan No. NV-050-6-6

This E.A.R. discusses the environmental impacts of implementing the actions proposed in the Beaver Dam Habitat Management Plan. These actions include:

1) Improving the availability of already existing waters to wildlife by developing springs and constructing water catchments.

2) Employing habitat treatment methods (chaining or prescribed burning) on about 26,000 acres.

3) Initiating studies to identify habitat condition and trend of crucial wildlife areas.

4) Assisting the range and wild horse/burro activities in development of allotment management and horse and burro management plans.

The impacts of these actions on living and non-living components and human resources are discussed along with measures to mitigate any adverse impacts. The mitigating measures mentioned in the E.A.R. (see attachment) are recommended as stipulations.

None of the actions that affect livestock grazing in the Beaver Dam area (chaining, prescribed burning, seeding) should be implemented until a grazing environmental impact statement for the Caliente Planning Unit (scheduled for FY 1978) has been prepared.

Based on the information contained in the E.A.R., it is determined that the other aspects of the proposed action do not constitute major Federal actions significantly affecting the human environment. Therefore, it is recommended that no impact statements be prepared for these actions. It is further recommended that these actions not affecting livestock grazing be implemented as proposed for the benefit of vegetation, wildlife and human resources.

This E.A.R. should be sent to the State Clearing House for review and comment.

Sept 25, 1975
Date

Phillip V. Range, Area Manager

I CONCUR:

Sept 26, 1975
Date

John S. Boyles, District Manager

Attachment

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

5010-108

Other adverse economic or social impacts include 1) loss of areas for pinyon nut collection, post cutting and Christmas tree gathering, 2) some public disapproval of "ugly" chaining or burning projects.

On the other hand, the proposed actions would have two major favorable impacts. First of all, habitat for livestock grazing would be improved. Grazing is an important economic activity in this WHA. Secondly, recreational opportunities would be increased. Improved wildlife habitat means improvement in the quality of hunting. Better hunting would benefit local people in 2 ways: 1) an increase in their own hunting pleasure 2) more revenue from the increased number of hunters passing through the two towns - Panaca and Caliente.

2. Possible Mitigating Measures

a. Non-Living Components

Air and Climate

Careful choice of time when chaining and burning will take place (time of lowest wind velocity; moist conditions for chaining, traveling, etc.) can reduce the amount of dust created by these operations.

Land

Soil tests should be made to determine best areas for burning or chaining. Mixing of concrete should be done in contained facilities to reduce the chance of soil pollution. Piles of downed trees left on the site will help reduce runoff of soil and water. If heavy vehicles used to transport men and equipment to project sites are restricted to existing roads, trails and washes, damage to fragile watershed areas will be kept to a minimum.

Areas of chainings or burns should be checked for mining claim markers prior to beginning the operation.

b. Living Components

Vegetation

Care should be taken during chaining to do as little damage as possible to valuable understory vegetation.

A mixture of browse, grass and forbs should be used to reseed the treated area.

Wildlife

Fences around waters should be constructed to wildlife specifications to allow easy access.

Patches of trees 10-15 acres in size scattered over the treated area will 1) preserve some habitat area for pinyon jays, pinyon mice and other species adapted to mature pinyon/juniper woodlands 2) maximize the edge effect and 3) leave areas of cover preserved for wildlife. See photo #8 for example of trees left standing within the Simpkins Chaining in Caliente.

Clean up of sites after construction of spring developments and water catchments should be quick and thorough, in order to encourage wildlife to return to the area as soon as possible.

Heavy vehicles carrying equipment and men should use existing roads, trails and washes to reduce damage to wildlife habitat in the vicinity of projects and to disturb the wildlife itself, as little as possible.

Livestock, Horses and Burros

Fencing the springs or guzzlers off solely for wildlife would be fatal to livestock, wild horses and burros. Provisions should be made for these animals, like piping water to separate troughs for them to use.

Total removal of livestock and horses would eliminate their competition with wildlife for water, forage and living space. But this would not be compatible with multiple use objectives or with the Wild Horse and Burro Act of 1971. Allotment Management Plans and Horse and Burro Plans should consider the habitat needs of all animals present and seek ways of satisfying their needs without overtaxing environmental resources.

c. Ecological Interrelationships

All the above mitigating measures would relieve some damage to ecological interrelationships caused by the proposed action.

d. Human Values

Landscape Character

Aprons of water catchments should be painted natural colors (pale beige, green or grey) to blend in with the surrounding environment. The sites should be thoroughly cleared of debris after construction is completed.

The aid of landscape architects should be solicited to design all chaining and burning projects. Treated areas should have irregular boundaries. Also, small areas of trees should be left standing to minimize the visual impact of opening up the formerly dense pinyon/juniper stands and to provide some shade and cover.

Socio-Cultural Values

Archeological surveys should be made of all proposed chaining or prescribed burning sites and water development areas in order to protect any possibly irreplaceable archeological values.

Known pinyon nut gathering areas should be excluded from treatment. Commercial and individual collections of Christmas trees, firewood and juniper posts should be concentrated in areas slated for habitat rehabilitations. Leaving some acres of trees standing within treatment areas will also help minimize post, firewood and Christmas tree loss.

It is important that the public be informed of proposed projects in this WHA. Many people misunderstand the purposes and benefits of pinyon and juniper tree removal. News releases, articles, slide shows, etc., should be developed and distributed to identify areas for rehabilitation and to describe the reasoning behind such actions and what the expected results will be.

3. Recommendations for Mitigation or Enhancement

All of the above mitigated measures are recommended.

4. Residual Impacts

Most of the temporary adverse impacts -- dust, temporary displacement of wildlife, littering of the landscape with

6620
27-050-6-6

E N V I R O N M E N T A L A N A L Y S I S R E C O R D

for

The Beaver Dam Habitat

Management Plan

N5-WHA-T24

Caliente Planning Unit

Las Vegas District

Las Vegas, Nevada

Prepared by: Denise P. Meridith
Environmental Specialist

June, 1975

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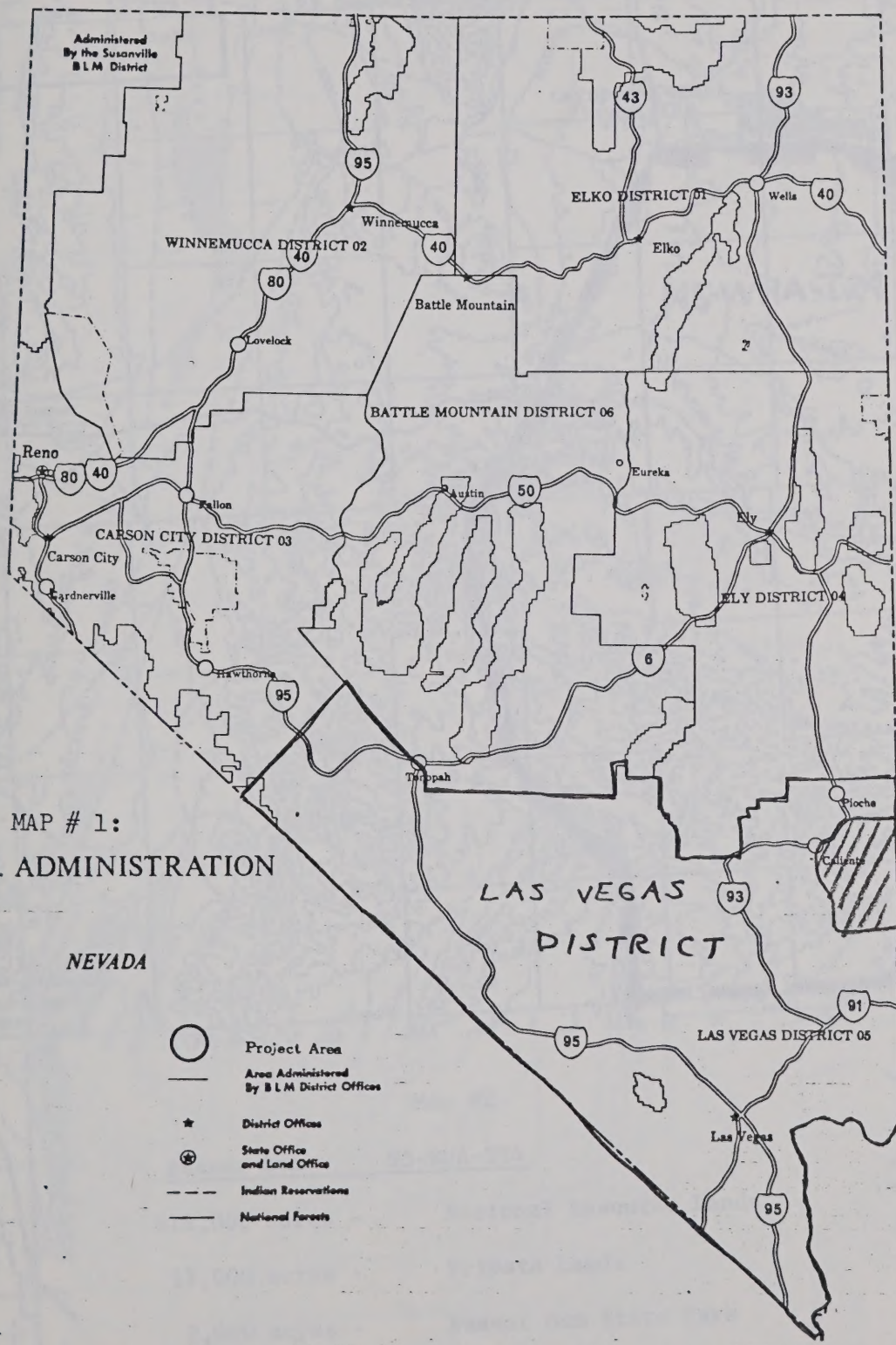
Introduction

This Environmental Analysis Report is being prepared for the purpose of evaluating the impacts of the actions proposed in the Beaver Dam Habitat Management Plan.

The Beaver Dam HMP was revised in May, 1975. The Beaver Dam Wildlife Habitat Area (from now on referred to as the Beaver Dam WHA) for which it was written covers 616,000 acres of national resource lands, 17,000 acres of private lands and 2,000 acres of state lands (see Maps #1 & 2). This WHA is part of the Las Vegas District's Caliente Planning Unit.

The overall objective of the plan was to document ways of maintaining and/or improving the terrestrial habitat for mule deer, Gambel's quail, mourning dove, cottontail rabbits, mountain lions and non-game species in the area. An HMP and E.A.R. on aquatic habitat in the area will be completed at a later date.

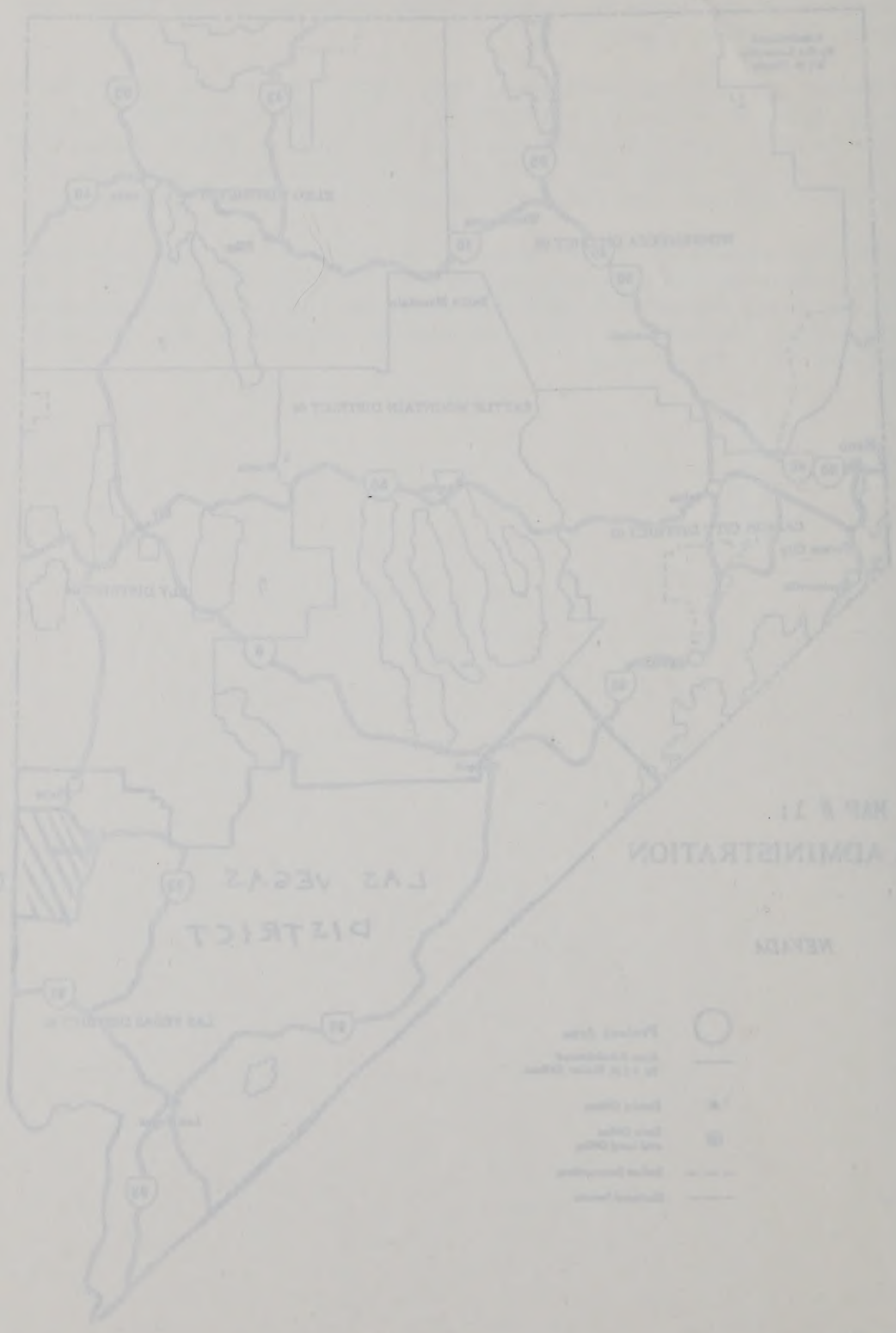


MAP # 1:

B.L.M. ADMINISTRATION

NEVADA

NS-WHA-T24 Beaver Dam



Map #2

Beaver Dam N5-WHA-T24

616,000 acres - National Resource Lands

17,000 acres - Private Lands

2,000 acres - Beaver Dam State Park

I. Description of the Proposed Action and Alternatives

The actions suggested in the HMP can be summarized as follows:

1. To improve the availability of already existing waters to wildlife by developing springs and modifying livestock troughs to accommodate wildlife. The following projects have highest priority for completion:

Garden Spring

Spring source needs fence protection. Install bird ladder in trough.

East Setting Spring

Fence spring source. Install spring box, pipeline, trough and bird ladder.

Quaking Aspen Spring

Fence spring source providing water for wildlife at the source while piping water ¼ mile north to campers.

Topah Spring

Two water sources about 600' apart. Repair old fences. Install new spring boxes. Pipe upper spring to lower spring box. Install new 400-500 gallon trough with expanded metal bird ramp.

Unnamed Spring

Fence spring source. Install new spring box. Pipe water 100 feet or less and install 400-500 gallon trough with expanded metal bird ramp.

Bunker Spring

Install spring box. Pipe water 25 feet to 400-500 gallon trough with bird ramp.

Sheep Spring

Fence source. Install spring box, pipe and 400-500 gallon trough with bird ramp.

Ella Spring

Remove old mustang trap to permit better use by deer.

Lime Mountain Well

Clean out trough. Add bird ramps.

Pine Canyon Stock Tank

Circular (50' diameter) steel trough need bird ramps. Install four expanded metal ramps 4-5' wide and 6' long.

2. To make more permanent water available to wildlife by constructing water catchment devices in the Ella Mountain, Sawmill Range and Enterprise Allotment areas. The following are the suggested catchment locations and priorities for construction (see Map #3):

Location	Priority
T. 3 S., R. 71 E., SW¼ Sec. 29	13
T. 3 S., R. 70 E., NE¼ Sec. 36	14
T. 3 S., R. 70 E., NE¼ Sec. 27	15
T. 4 S., R. 71 E., Sec. 17	6
T. 4 S., R. 71 E., SW¼ Sec. 19	7
T. 4 S., R. 70 E., SE¼ Sec. 23	8
T. 5 S., R. 71 E., SW¼ Sec. 31*	1
T. 5 S., R. 71 E., SW¼ Sec. 30*	2
T. 5 S., R. 70 E., SE¼ Sec. 26	3
T. 5 S., R. 70 E., Sec. 34	4
T. 5 S., R. 70 E., SW¼ Sec. 13	11
T. 5 S., R. 69 E., NE¼ Sec. 34	12
T. 5 S., R. 67 E., SE¼ Sec. 20	21
T. 5 S., R. 67 E., SW¼ Sec. 28	22
T. 6 S., R. 71 E., SW¼ Sec. 6	5
T. 6 S., R. 70 E., SE¼ Sec. 12	10
T. 6 S., R. 70 E., SW¼NW¼ Sec. 15	9
T. 6 S., R. 69 E., NW¼ Sec. 19	16
T. 6 S., R. 69 E., NW¼ Sec. 20	17
T. 6 S., R. 68 E., NE¼ Sec. 9	18
T. 6 S., R. 68 E., NW¼ Sec. 6	19
T. 6 S., R. 67 E., SW¼ Sec. 2	20

*These catchments were installed in Fiscal Year 75.

3. To employ habitat treatment methods (chaining or prescribed burning), on about 26,000 acres to a) increase the composition of palatable forbs from the present trace to 5-10%, b) increase composition of grasses, c) increase bitterbrush/cliffrose composition, reproduction and availability.

Meridith, 1975

Map #3: N5-WHA-T24: Beaver Dam --- Proposed Habitat Developments

(G) Wildlife Guzzlers

Prescribed Burning

♂ Spring Developments

Chaining and reseedings:

1- Ella Spring
2- Oak Wells
3- Bunker Pass
4- Marble Reservoir
5- Sheep Spring
6- Mahogany Knoll

The following (also shown on Map #3) are the areas suggested for chaining:

Ella Spring (7,700 acres)

Severely degraded, potential deer summer habitat.

Oak Wells (9,200 acres)

Severely degraded, in potential deer summer habitat.

Bunker Pass (4,000 acres)

Badly degraded critical deer, summer habitat, but with treatment good release of bitterbrush and serviceberry can be attained.

Marble Reservoir (2,000 acres)

Seedings of extremely poor composition, in potential deer summer habitat.

Sheep Spring (2,300 acres)

Seedings of very poor composition, potential deer summer habitat.

Mahogany Knoll (700 acres)

Seeding of extremely poor composition, potential deer summer habitat.

These areas would be chained, then reseeded with a combination of the following plants:

Smooth brome)
Curlleaf mahogany) higher elevations
Russian wildrye
Bluestem wheatgrass
Alfalfa
Chickpea milkvetch
Utah sweetvetch
Arrowleaf balsamroot
Small burnet
Fourwing saltbush
Antelope bitterbrush
Woods rose
True mountain mahogany

At least 10-15 acres of each 100 acres treated would remain undisturbed. Such irregular shaped chainings would increase aesthetic appeal, edge effect and value of the project to wildlife.

In addition to the above-mentioned project, small acreages (each 15-50 acres in size) of the south slope of the Sawmill Range are to be controlled burned (see Map #3 for area involved).

This area is too steep to chain. The prescribed burning of this predominantly manzanita and oak covered area followed by seeding (with some plants described under chaining) is supposed to increase composition of palatable forage and improve the edge effect.

The public will be informed during the specific planning and implementation of these habitat rehabilitation projects through news releases, newspaper feature articles, etc.

4. To assist the range activity in the development of Allotment Management Plans or other means of grazing management on areas containing crucial wildlife habitat by providing basic data on the habitat requirements of wildlife. Allotments presently identified as containing crucial wildlife habitat and which are in need of AMPs include: Enterprise, Clover Creek, Oak Wells, Little Mountain, Pennsylvania, Sheep Flat, Cottonwood, and Mustang Flat Allotments.

5. To obtain the following private lands when and if these acquisitions become the only ways of assuring hunter access to national resource lands or the only way vital maintenance or development of wildlife habitat can be accomplished:

Rabbit Spring - T. 2 S., R. 69 E., Sec. 34.
Oak Wells - T. 3 S., R. 69 E., Sec. 35.
Miller Spring - T. 3 S., R. 69 E., Sec. 24.
Along Meadow Valley Wash -
T. 7 S., R. 67 E., Secs. 7, 20, 21, 26, 27, 28, 34, 35.
T. 8 S., R. 67 E., Secs. 27, 34.
T. 6 S., R. 66 E., Sec.
Along Clover Creek -
T. 4 S., R. 68 E., Secs. 7, 21, 27, 28.
T. 5 S., R. 69 E., Secs. 2, 8, 11, 13, 14, 15, 16, 17, 22, 24, 25, 30, 31, 32, 37.

6. To initiate studies that will identify habitat condition and trend of crucial areas for endangered and other non-game species, areas of heavy competition among cattle, horses and wildlife and to gather the information which will aid in the management of the area.

7. To cooperate with wild horse and burro activity on a horse and burro management plan for the area.

The implementation schedule for these projects is included. It covers a span of six years.

Each of the suggested actions is composed of a series of stages and discrete actions. For instance, habitat rehabilitation would involve 1) selection of the site, 2) the actual chaining or burning, 3) reseeding, and 4) posting or fencing the area, if necessary. In turn, selection of the site involves on-the-ground selection, pellet counts, soil sampling, etc.

Alternatives to the present proposed action are: 1) modification of the implementation schedule and 2) no action.

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HABITAT MANAGEMENT PLAN IMPLEMENTATION SCHEDULE
N5-WHA-T24: Beaver Dam

Subactivity 1285 - Wildlife	Current Year			Program Year			Program Year + 1			Program Year + 2			Program Year + 3			Program Year + 4		
Work-Job Code	Cost (000's)	Units	M/M	Cost (000's)	Units	M/M	Cost (000's)	Units	M/M	Cost (000's)	Units	M/M	Cost (000's)	Units	M/M	Cost (000's)	Units	M/M
2025 (Inventory and Analysis)				.75	1	.5												
2130 (Studies and Research)				3		2	3		2	3		2	3		2	3		2
2240 (Habitat Treatment and Planning)		-		.75	1	.5	.75	1	.5	.75	2	.5	.75	2	.5			
2439 (Evaluation and Revision)	1.5	1	1	.75	1	.5	.375	1	.25	.375	1	.25	.375	1	.25	.375	1	.25
3001 (Public Affairs)		-		.375		.25	.375		.25	.375		.25	.375		.25	.375		.25
3806 (Environmental Analysis)	1.5	1	1	.75	1	.5	-	-		-	-		-			-		
6002 (Revegetation, Mechanical)		-		308*	7,700 acres	2	368*	9,200 acres	2	160*	4,000 acres	1	80*	2,000 acres	1	120*	3,000 acres	1
6003 (Revegetation, Burning)		-			-			-			-		475*	65,000 acres	1	-	-	
6242 (Water Developments - Springs)		-		2*	2	1	2*	2	1	2*	2	1	2*	2	1	2*	2	1
6245 (Water Developments - Catchments)	10 1.5*	2	1	20*	4	2	20*	4	2	20*	4	2	20*	4	2	20*	4	2
8078 (Maintenance - Water Development)				.5*	2	.5	1*	6	1	1.5*	16	2	2*	20	2	3*	26	2

* These figures do not include costs of man months - other computations are based on the standard: $1,500. per man month.

II. Description of the Existing Environment

A. Non-Living Components

1. Air and Climate

The Beaver Dam WHA is located in the Great Basin desert. Precipitation (between 8 and 9 inches per year), and humidity (less than 15% during the summer) are low. Temperatures can reach over 100° during the summer. Winds can also reach high levels, as high as 50-80 m.p.h. Droughts occur occasionally. This climate all but precludes farming without irrigation; it favors range vegetation for livestock.

Due to the lack of industry and automobile traffic, the air quality in the area is usually good. Occasionally high winds can cause some dust pollution.

2. Land

a. Topography

The elevation of the Tertiary volcanic mountains in the area ranges from slightly less than 5,000 to over 7,000 feet. Generally the northern part of the WHA is characterized by large, gently rolling areas with many wide draw floors and high flat ridges. The southern portion (Sawmill Range) is steep and mountainous with deep, narrow draws. The deep, sheer-walled Meadow Valley Wash forms the western border of the Habitat Area.

b. Soils

Soils of the area are lithosols and browns, shallow and weakly developed. Parent materials are igneous. Erosion is a problem. Soil sites, devoid of any understory vegetation are not uncommon, particularly in the dense pinyon/juniper woodlands.

c. Minerals

There is presently little mining in this WHA (there are several small gold and silver properties). There may be some mining claims in the area. Most of the Caliente region has some potential for oil, gas and geothermal resources. Increased exploration can be expected as a result of the nationwide energy crunch but probably little or no production will result.

d. Land Uses

Livestock grazing (27 allotments), recreation (hunting, fishing, etc.), small commercial ventures (occupying about 13 acres of land in Panaca and Caliente) are some of the land uses occurring on national resource, state and private lands in the area.

e. Land Use Planning

Steps 2, 3 and 4 of the Unit Resource Analysis and Steps I, II, and III of the Management Framework Plan for the Caliente Planning Unit have been completed. This planning is scheduled to be updated in Fiscal Year 76.

The Step III Management Framework Plan decisions that apply to this WHA are listed in the Appendix.

3. Water

Surface water is scarce in the Beaver Dam WHA. Major water sources include Beaver Dam Creek, Clover Creek, Cottonwood Creek, Pine Creek and the largest, Meadow Valley Wash. Meadow Valley Wash's average flow is 11.3 cubic feet/second or about 8,200 acre-feet/year. In addition, Matthews Canyon and Pine Canyon washes have flows during times of heavy rainfall or rapid snowmelt.

Most of the water available to livestock, wildlife and people comes from underground sources. Table 1 lists the major springs found in the WHA. Ground water recharge for these springs is derived mostly from precipitation within the drainage area. A lot of ground water in the area is discharged through evapotranspiration (phreatophytes include greasewood, rabbitbrush, meadow grass and salt bush, cottonwood, willow and saltcedar) and pumping for irrigation.

Table 2 shows a chemical analysis of well water in the Meadow Valley area. Sulfate and dissolved solid concentrations are high in this area as they are throughout most of the Las Vegas District. The reasons for the high mineral content of water in southern Nevada water include 1) high evaporation rates leaving high concentrations of salt at or near the surface, 2) slow movement of water through the ground, dissolving metallic and non-metallic substances (like sulfides, borate, gypsum, etc.) prevalent in the soil and 3) large amounts of dust washed into ground water supplies.

TABLE 1

BEAVER DAM WATER RESOURCES

Township-Range	Section	Name	Species	Needs Dev.
T.8S., R.71E.	32	Lime Mtn. Spring	Quail, dove	Unkn.
T.8S., R.70E	14	Lime Mtn. Well	Unknown	Unkn.
" "	6	White Tent Spring	Unknown	Unkn.
T.8S., R.69E.	2	Sam's Camp Well	deer, quail, songbirds	No
" "	9	Box Spring	deer, songbirds	No
" "	6	Garden Spring	deer, songbirds	Yes
T.7S., R.71E.	30	Ooze Flat Res.	Unknown	Unkn.
T.7S., R.70E.	10	Kate Spring	Unknown	Unkn.
" "	12	Rueben Spring	Unknown	Unkn.
" "	12	Betsy Spring	Unknown	Unkn.
T.7S., R.69E.	1	East Setting Spring	deer, songbirds	yes
" "	2	Quaking Aspen Spring	deer, songbirds	yes
" "	25	Topah Spring	deer, songbirds	yes
T.7S., R.67E.	1	Grapevine Spring	Unknown	Unkn.
T.6S., R.71E.	8	Unnamed Spring	deer, songbirds	yes
" "	31	Ash Spring	N.A.	dry
T.6S., R.70E.	2	Middle Pass Res.	deer	no
" "	12	Middle Pass Spring	N.A.	dry
" "	20	Mud Spring	Unknown	yes
" "	14	Bunker Spring	deer, songbirds	yes
" "	30	Jack Canyon Reservoir	deer, songbirds	no
T.6S., R.69E.	9	Pine Canyon Stock Tank	deer, dove, songbirds, teal	no
" "	10	Cliff Res.	Unknown	Unkn.

BEAVER DAM WATER RESOURCES (cont.)

Township-Range	Section	Name	Species	Needs Dev.
T.6S., R.69E.	27	Boulder Res.	deer, dove, songbirds	no
" "	28	Sheep Spring	songbirds, occas. deer	yes
T.6S., R.68E.	14	Fife Spring	songbirds, occas. deer, occas. bighorn	no
T.6S., R.67E.	32	Mud Spring	songbirds, deer	no
" "	22	Carson Spring	songbirds, deer	no
T.5S., R.71E.	4 & 9	Pine Park Creek	deer, songbirds, dove, occas. teal	no
" "	18	Rock Spring	Unknown	unkn.
T.5S., R.70E.	31	Barclay Well	dove, occas. deer	no
" "	31	Rolling Hills Res.	songbirds, dove	no
" "	33	Red Rock Can. Well	Unknown	unkn.
T.5S., R.69E.	35	Marble Res.	N.A.	dry
" "	7, 8, 14, 15 & 16	Clover Creek	deer, dove, songbirds, occas. teal, shore birds	no
" "	35	Marble Res.	N.A.	dry
T.5S., R.68E.	2, 11, 12	Clover Creek - Big Spring	deer, dove, songbirds, occas. teal, shore birds, plus rainbow trout	no
T.5S., R.67E.	23	Grade Seep-Res.	deer, dove, songbirds	no
" "	24	Ella Spring	deer, dove, songbirds	yes
" "	20	Unnamed Res.	heavy deer, songbirds	dries
T.4S., R.70E.	11	Brown Well	dove, songbirds, occas. deer	no
" "	35	Staheli Well	deer, dove, songbirds	no

BEAVER DAM WATER RESOURCES (cont.)

Township-Range	Section	Name	Species	Needs Dev.
T.4S., R.68E.	27, 28, 34	Clover Creek (Sec. 28 PWR)	Deer, dove, songbirds, occas. teal, shorebirds, rainbow trout	no
T.4S., R.67E.	7, 8	Clover Cr.-Meadow Valley Wash	Dove, songbirds, occas. teal and mallards, occas. deer	no
" "	14	Willow Spring	Unknown	Unkn.
" "	15	Oak Spring	Unknown	Unkn.
" "	23	Lower Ash Spring	Unknown	Unkn.
" "	27	Upper Ash Spring	Unknown	Unkn.
T.3S., R.71E.	30	Enterprise Res.	Unknown	Unkn.
T.3S., R.70E.	7	Sheep Spring	deer, songbirds, dove	no
" "	9	Sheep Spring supplemental	deer, songbirds	no
T.3S., R.69E.	18	Buckboard Spring	N.A.	dry
" "	24	Miller Spring (private)	Unknown	Unkn.
" "	35	Oak Wells (private)		
T.2S., R.69E.	24	Dow Spring	Unknown	Unkn.
" "	34	Rabbit Spring (private)	Unknown	Unkn.

Myers, 1970

TABLE 2

Table 13.--Chemical analyses, in parts per million, of water from the Meadow Valley area

(Field analyses by the U.S. Geological Survey)

Location	Owner and/or name	Date collected	Calcium (Ca)	Magnesium (Mg)	Bicarbonate (HCO_3)	Chloride (Cl)	Total hardness	Specific conductance (micromhos at 25°C)	pH	Remarks[1/]
				Spring Valley						
Sec. 7, T. 3 N., R. 69 E.	Parsnip Wash Spring	10-25-63	18	5.1	98	13	66	211	7.8	Surface water sample.
Sec. 7, T. 2 N., R. 70 E.	Spring Valley Creek	10-25-63	51	10	268	39	168	575	7.8	Surface water sample taken at bridge over wash.
Sec. 25, T. 2 N., R. 69 E.	Spring Valley Creek	10-27-63	--	--	- -	--	---	528	--	Surface water sample taken at gage site in canyon between Spring and Eagle Valley.
				Eagle Valley						
1N/69-10d1	Paul Bliss well	10-25-63	95	17	412	65	262	927	7.4	
Sec. 15, T. 1 N., R. 69 E.	Spring Valley Creek	10-25-63	--	--	- -	--	---	681	--	Surface water sample taken in canyon between Eagle and Rose Valleys.
				Rose Valley						
Sec. 28, T. 1 N., R. 69 E.	Spring Valley Creek	10-26-63	72	15	342	48	242	711	8.1	Surface water sample taken in canyon between Rose and Dry Valleys.
1N/69-21a2	James Rosa well	10-25-63	73	9.8	294	43	222	672	7.5	
				Dry Valley						
Sec. 28, T. 1 S., R. 68 E.	Meadow Valley Wash	10-27-63	33	4.7	137	41	113	442	8.7	Surface water sample taken at mouth of Condor Canyon. Also: Carbonate (CO_3), 10 ppm.
1S/69-6d1	Delmue Brothers - North well	10-26-63	83	12	480	55	257	774	7.5	
				Patterson Valley						
3N/66-2d1	Twenty-one mile holding corral well	10-23-63	42	9.0	129	30	142	374	7.8	
				Panaca Valley						
1S/68-33c1	C. Kenneth Lee - South well	12- 4-63	41	9.8	214	13	143	508	7.7	
2S/67-24d1	Roy Kurt - No. 1 well	10-27-63	82	25	268	117	307	1,120	7.5	
Sec. 4, T. 2 S., R. 68 E.	Panaca Spring	4-15-63	31	9.8	189	15	118	401	8.1	Warm Spring, 2 miles north of Panaca. Also: Silica (SiO_2), 51; Iron (Fe), 0; Sodium (Na), 38; Potassium (K), 6.8; Sulfate (SO_4), 29; Fluoride (F), 1.6; Nitrate (NO_3), 2.6; Boron (B), 0.1; Dissolved solids, 271.
2S/68-5b1	Harry H. Horlacker well	12- 4-63	61	31	354	89	280	1,050	7.6	
2S/68-7a1	Panaca LDS Church well	12- 4-63	65	21	239	125	250	810	7.8	
2S/68-8b5	U.S.G.S. - Observation well	12- 3-63 6-1949	56 22	31 24	619 1,130	107 282	266 154	1,700 3,390	7.6 - -	Half mile west of Panaca. Also: Silica (SiO_2), 85; Sodium (Na) + Potassium (K), 795; Sulfate (SO_4), 507; Fluoride (F), 12; Nitrate (NO_3), 0; Boron (B), 1.0; Dissolved Solids, 2,280.
2S/68-8c3	Delmue Brothers - North well	12- 4-63	61	31	308	63	282	1,020	7.8	
2S/68-8c4	Delmue Brothers - South well	12- 4-63	114	68	500	274	565	2,240	7.5	
2S/68-18d2	Don Wadsworth - No. 1 well	10-28-63	157	24	462	117	488	1,780	7.4	
2S/68-19a1	Don Wadsworth - No. 2 well	10-28-63	111	18	426	71	350	1,330	7.5	
3S/67-1b1	Grant Lee - No. 1 well	12- 4-63	73	31	328	55	310	1,010	7.7	
3S/67-28c1	Chester Oxborrow - No. 2 well	12- 4-63	24	7.5	183	31	91	480	9.2	
				Lower Meadow Valley						
4S/66-24a1	Emory Conaway - Middle well	12- 5-63	70	15	340	37	236	793	7.7	Two miles south of Caliente.
4S/66-25b1	Emory Conaway - Lower well	12- 5-63	53	11	272	26	176	592	7.8	Three miles south of Caliente.
4S/67-18b1	Emory Conaway - Upper well	12- 5-63	54	16	260	21	174	522	7.7	Half mile west of Caliente.
7S/67-21c1	James W. Bradshaw well	12- 5-63	43	14	340	43	165	812	8.0	Three miles south of Elgin.
12S/65-13b1	Mildred Breedlove well	12- 5-63	109	67	264	95	546	1,540	7.9	Near Rox, Nevada.
14S/66-35d1	L. J. McCormick well	10-10-49	132	80	250	32	658	1,450	- -	At Glendale. Also: Silica (SiO_2), 27; Sodium (Na) + Potassium (K), 62; Sulfate (SO_4), 516; Nitrate (NO_3), 8.8; Dissolved solids, 981.

1. Water temperature shown in table 15.

Rush, 1964

4. Hazards

There is no history of any landslide or other earth failure hazards in the area.

Floods present the primary hazard in the Beaver Dam WHA. In 1906 and 1910, major floods occurred along Meadow Valley Wash and Clover Creek. Lesser floods occurred in 1907, 1908, 1911, 1914, 1922 and 1938. In 1955 two flood control dams were built in Clover Valley. Flash floods can occur in other areas during thunderstorms.

In 1960, a study was prepared jointly by the Lincoln County Flood Control District, Meadow Valley Soil Conservation District, the Department of Agriculture and Soil Conservation service and BLM. The study recommended the construction of numerous, small retainer dams along tributaries. The Preliminary Lincoln County Master Plan (1974) encouraged the installation of these projects along with the seeding and planting of erosion-prone areas. The Meadow Valley Wash remains classified as a flood prone area by the U. S. Geological Survey.

B. Living Components

1. Vegetation

Most of the Beaver Dam WHA supports a dense pinyon/juniper woodland with sagebrush and cliffrose understories. For a more detailed description of vegetation in the area, refer to the Beaver Dam Intensive Inventory.

2. Wildlife

The major species in the area are the mule deer, Gambel's quail, mourning dove, cottontail rabbit, desert tortoise, mountain lion and raptors. See Photos #1 and 2. For a thorough discussion of wildlife, known habits and habitat requirements, refer to both the Beaver Dam Intensive Inventory and HMP.

3. Livestock

See Beaver Dam HMP.

4. Wild Horses and Burros

See Beaver Dam Intensive Inventory and HMP.

PHOTO #1: Mule Deer Herd - Beaver Dam WHA

PHOTO #2: Desert Tortoise - Beaver Dam WHA

C. Ecological Interrelationships

A complex web of ecological cycles and interrelationships is at work within the Beaver Dam Wildlife Habitat Area.

Solar energy strikes the earth; some is reflected back into the atmosphere, some is absorbed by the soil and plants. Through photosynthesis, the energy is used to produce sugars, proteins and carbohydrates. Some plants die and their nutrients are recycled into the soil. Others are consumed by the herbivores (plant-eating animals) present in the area. Some of the major herbivores include mule deer, quail, chukar, horses, cottontails, jackrabbits, doves, reptiles and rodents. In turn, these animals either die of natural causes or are eaten by predators like coyotes, raptors, bobcats, mountain lions and foxes. Scavengers in the form of ravens, insects and others clean up carrion. Those dead animals which aren't consumed, decay and are recycled into the soil.

In the Beaver Dam WHA, pinyon and juniper trees are a dominant form of vegetation. They grow rapidly in the absence of succession - controlling wildfires and in areas where other, more palatable vegetation is overgrazed by livestock or wild horses and burros. Pinyon and juniper trees tend to crowd out other forms of vegetation: allelopathic substances, litter and shade retard growth of understory plants. Only a few wildlife species like pinyon mice and pinyon and scrub jays are adapted to life in these dense woodlands, using the trees as sources of both food and cover.

The water cycle is, of course, another important aspect of ecological interrelationships in this area. Precipitation falls in the form of snow or rain. A very small amount infiltrates the soil. Most is either evaporated (as a result of high summer temperatures, low humidity and high winds) or runs off down gullies, carrying off the soil and loose pebbles. The lack of understory vegetation beneath dense pinyon/juniper stands makes many areas prone to erosion. Water that infiltrates the soil is thirstily absorbed by the roots of plants and, that which is not used in photosynthesis, is transpired into the atmosphere.

Most of the animals and plants in desert areas like this one have adaptations which allow them to survive with little water. Plants have extensive root systems to take advantage of the small amounts of water which infiltrate the soil and leaves with small surface area to cut down transpiration. Animals have physiological (special metabolic, excretory and respiratory systems) and/or behavioral (nocturnal habits, estivation, etc.) adaptations.

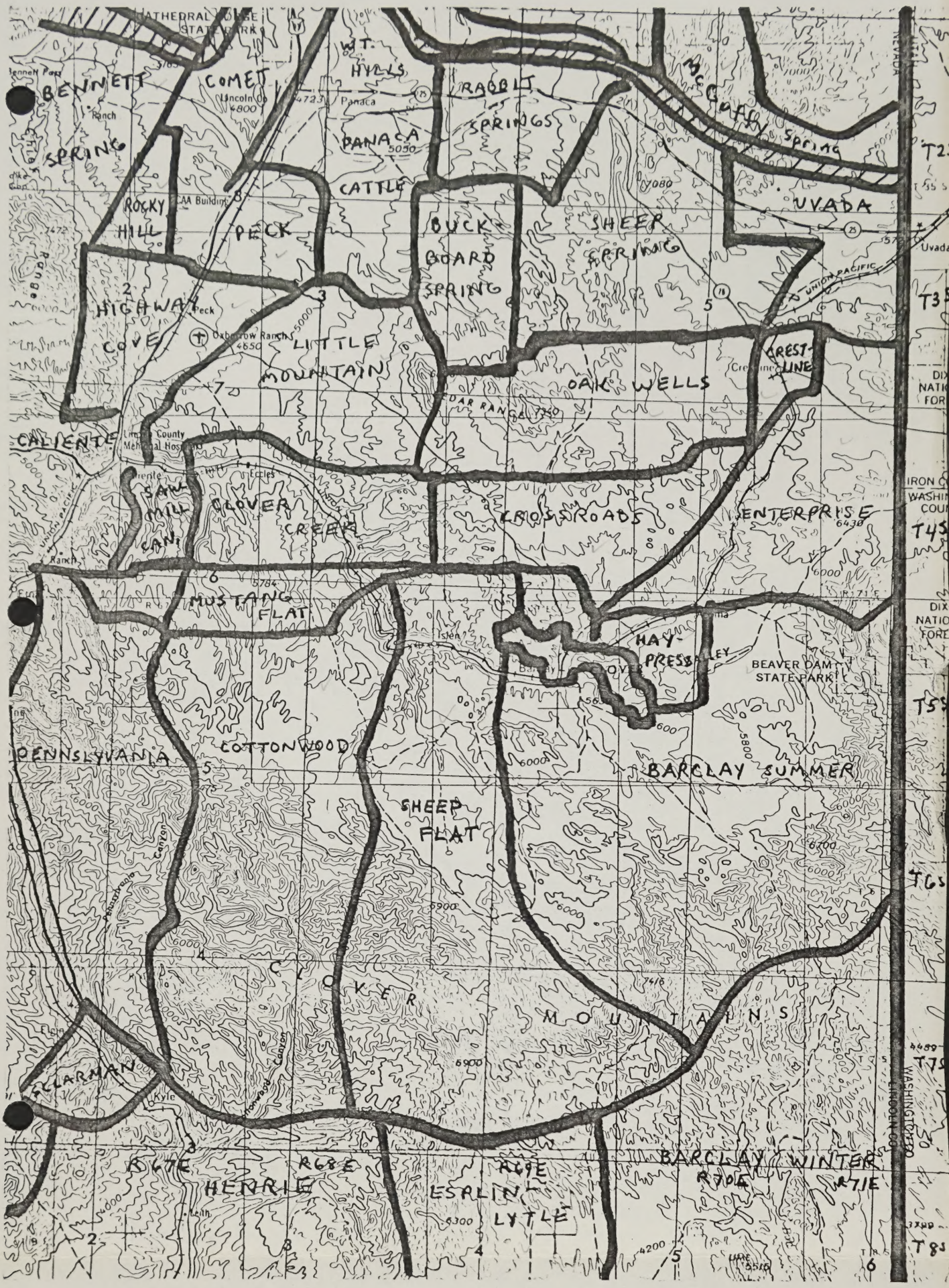
Table 3

LINCOLN COUNTY EMPLOYMENT BY INDUSTRIAL SECTOR, 1970

Item	Total County Sector Employment	Total State Sector Employment	Total County Employment By Sector as Percent of All Industrial Sector Employment	Total County Employment By Sector as Percent of Total County Employment	Total County Employment By Sector as Percent of Total State Employment
Industry					
Agriculture	77	4,786	1.60	8.54	0.03
Mining	51	3,708	1.37	5.65	0.02
Construction	89	16,270	0.54	9.87	0.04
Manufacturing	14	10,357	0.13	1.55	[a]
Public utilities	128	15,357	0.83	14.19	0.06
Trade	82	30,209	2.55	9.09	0.04
Finance, insurance and real estate	31	8,258	0.37	3.44	0.01
Services	182	39,815	0.45	20.17	0.09
Tourist-related services	132	54,571	0.24	14.64	0.06
Government	116	14,478	0.80	12.86	0.05
Total county employment	902				
Total State employment		197,809			
Total county employment as percent of total State employment	0.45				

[a]Less than .01 percent.

Source: U.S. Bureau of the Census, Census of Population: 1970 General Population Characteristics.



MAP # 4: Livestock Allotments in the Beaver Dam WHA

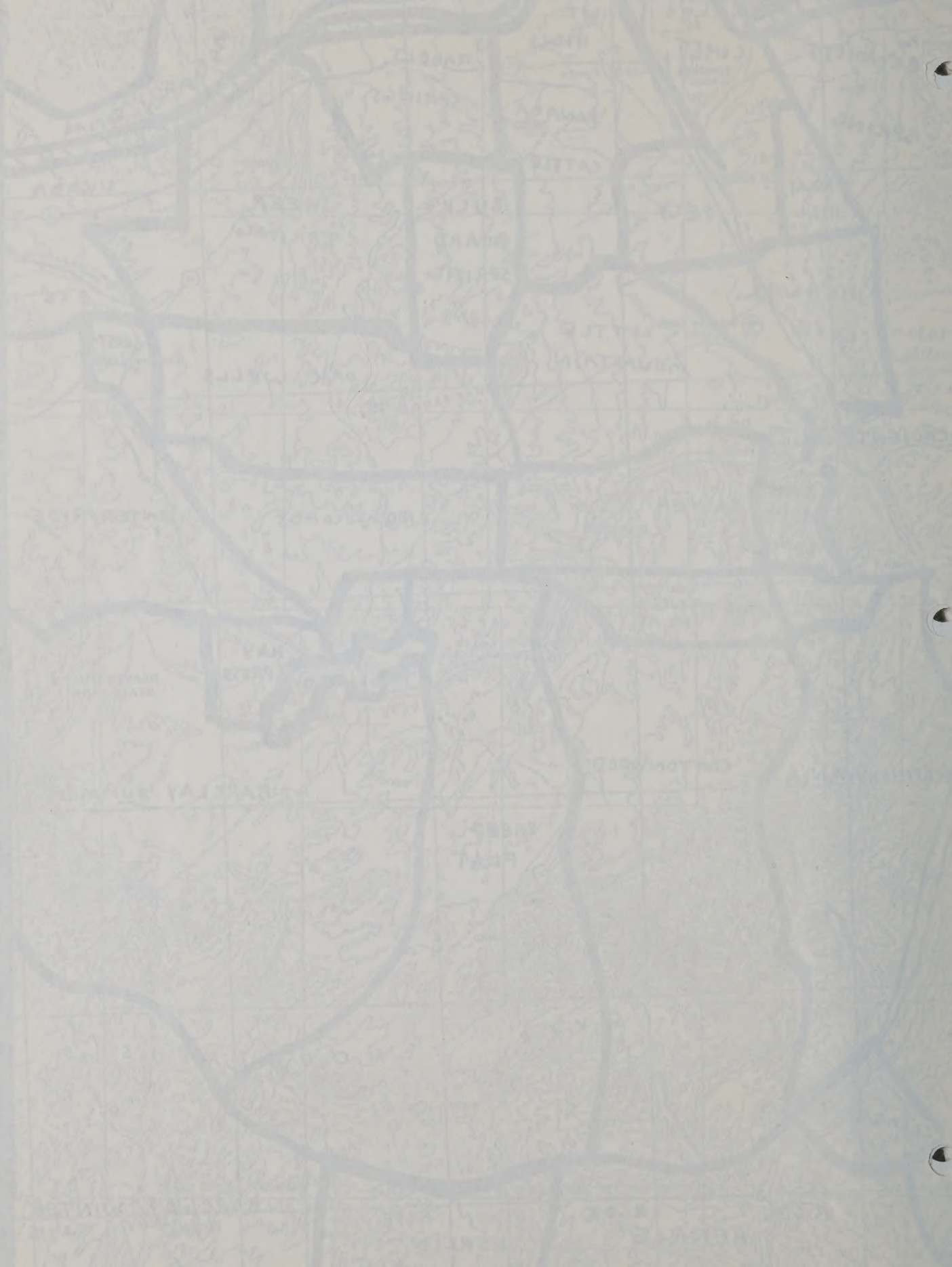


PHOTO #3

Quaking Aspen Spring - Beaver Dam WHA

PHOTO #4

PHOTO #5: Caliente Railroad Station

PHOTO #6: Panaca Charcoal Kilns

Thus, the combination of scarce surface water supplies and pinyon/juniper encroachment are the primary influences on ecological interrelationships in the Beaver Dam WHA. These two factors are presently limiting the diversity of vegetation and wildlife and numbers of livestock and horses that can exist within the confines of this ecosystem.

D. Human Values

1. Landscape Character

The mountains in this WHA are aesthetically appealing. They are cool and moist compared to the parched desert lowlands that cover much of the Las Vegas District. A person can retreat to many isolated, quiet and refreshing spots to relax, view desert wildflowers or birdwatch. Areas like Quaking Aspen Spring (see photos #3 and 4) and Beaver Dam Creek are particularly appealing to recreationists.

2. Socio-Cultural Interests

a. Archeology

No archeological surveys have yet been conducted by BLM in this area.

b. Historical Values

Lincoln County was first visited by white people in the 1820's, Jedediah Smith was one of the first explorers.

In the 1860's, the discovery of mineral values encouraged the immigration of whites. In 1863, Paiute Indians led William Hamblin, a Mormon missionary, and some of his followers to Panaca.

Lincoln County was formed in 1866.

Caliente was first established in the 1900's as a railroad center.

Some of the sites which remain today to document the history of the area include the Panaca charcoal kilns, and an abandoned railroad station in Caliente (see photos #5 and 6).

c. Socio-Economic Factors

The two largest towns in the area are Panaca and Caliente, both located along the western border of

the WHA. In 1970, the population of Panaca was 539, while about 900 lived in Caliente. By 1990, these populations are expected to increase to 700-770 and 1260-1350, respectively.

Table 3 shows the types of industries employing Lincoln County residents. The median family income in Lincoln County in 1969 was $8,864. Almost 12% of all families have incomes below the poverty level.

About 83% of the 6,800,000 acres in Lincoln County are managed by BLM. Two of the major activities that would be affected by this HMP are agriculture and hunting. As stated earlier, there are 27 allotments within this WHA (see Map #4). Cattle raising is an important industry in the area.

Over 400 hunting licenses are issued annually in Lincoln County for big and small game. Mule deer is probably the most important game species in Lincoln County. Of the 12,300 hunter days utilized for mule deer in the Las Vegas District, in 1970, 10,981 (over 85%) occurred in Lincoln County. In addition, 1980 days were spent hunting for dove, 2760 for quail and 4185 for rabbit.

III. Analysis of the Proposed Action and Alternatives

A. Environmental Impacts of the Proposed Action

1. Anticipated Impacts

a. Non-Living Components

Air and Climate

The proposed actions have no effect on climate. Any effect they have on air quality is temporary. During the construction of water catchments (transportation of men and materials to and from the sites, digging holes, etc.) and during and immediately after chaining (before vegetation reestablishment), dust may be a problem. Also the prescribed burning will add carbon dioxide, water and particulates (in the form of smoke and soot) to the atmosphere during the operation. The degree of the negative impact these action have on air quality depends on wind velocities and direction, soil moisture and vegetative conditions at the times and sites chosen for the operations.

Land

The proposed action would have no effect on the topography or minerals of the area.

There will, however, be effects on the soils. First of all, chaining will churn up the soil surface, breaking up any vesicular crusting present. The degree of tilling depends on soil characteristics and density of vegetation present. Until the seeding takes and vegetation becomes reestablished, the chained or burned areas may be subject to erosion during heavy thunderstorms. After the browse, grass and forbs become established, however, soil stability will be greatly improved.

Secondly, fragile watershed areas may be damaged by vehicles and equipment moving to and from guzzler sites. Mining claim markers could also be destroyed by chaining and burning.

Land uses will not be greatly affected by the proposed action. The chainings, seedings, burning, spring and water catchment developments will improve conditions for wildlife and the quality of hunting in

the area. Commercial or industrial ventures within town limits will not be affected. The acquisition of private lands around waters, if it ever occurs, will only preserve the status quo and preclude further development detrimental to wildlife resources.

The proposed actions are complementary to most of the actions recommended in the Caliente Management Framework Plan decisions.

Water

The proposed actions-spring improvements, water catchments, chainings, burning, seedings-will have a variety of effects on water in the Beaver Dam WHA. During the construction phase of spring development, the spring and surrounding area will be disturbed, making the water unavailable for wildlife and livestock. This effect is temporary, though, and more water will be available for livestock and wildlife after the work is completed. Fencing the original sources for wildlife, while piping water to troughs for livestock and horses will improve water quality of the springs; horses, burros and livestock will no longer be able to trample and muddy the sources. Bird ladders and floats will make more surface water available to small birds and mammals.

Water catchments will collect and store rainwater during storms and make this water available yearlong to big game, small game and non-game species. This will increase the carrying capacity of the area for wildlife.

If downed timber isn't left after chaining, run-off will be a problem until vegetation is reestablished. Once it is, runoff will be less than it is on areas dense with pinyon and juniper trees.

Hazards

The seedings with grass, browse and forbs that follow chaining and prescribed burning will reduce the chance of flash floods by slowing down runoff after thunderstorms.

b. Living Components

Vegetation

Both chaining and prescribed burning will, of course, have a major effect on vegetation on the 25,000 acres shown on Map #3. The initial effect of chaining will be to uproot large, mature trees. Some understory browse plants that don't have the physiological capacity for regrowth through sprouting may be harmed. Also, the small trees left standing may be stimulated to grow more quickly than they would have without chaining.

But the beneficial effects of a well-planned chaining are numerous. Some browse plants return with increased vigor and growth after chaining. The stand is opened up by chaining, allowing grasses, forbs and shrubs to increase production.

Prescribed burning on areas too steep to chain, will reduce the numbers of large trees as well as thick accumulations of litter that prohibit growth of grass, forbs and browse.

The edge effect (the amount of interfacing between woodlands and open areas relished by most species of wildlife) is also increased by chaining and burning.

The percentage of trees left standing, the severity of chaining's effect on understory browse, the types of vegetation that are reestablished, the longevity of the project, in general, the success of chaining can all be controlled by careful planning.

Wildlife

The Beaver Dam Intensive Inventory and HMP identify lack of permanent water and lack of palatable browse, grasses and forbs as major limiting factor for wildlife in this WHA. Wildlife will be temporarily displaced during the construction stage of bird ladders, water catchments and spring developments. But once the improvements are completed, more permanent water will be available for more species.

The reduction of habitat for pinyon jays, pinyon mice (and the other few species adapted to pinyon/juniper

woodlands) caused by chaining and burning will be counter-acted by the increase in carrying capacity for deer, quail, raptors, songbirds and most other species. Browse, grasses and forbs preferred by these species would be planted and encouraged to grow.

The studies proposed will reveal valuable information about game nongame species, their distribution and habitat preferences that will help BLM make habitat management decisions.

Livestock, Horses and Burros

Livestock, wild horses and burros would benefit from water and forage improvements as much as the wildlife would. A mature pinyon/juniper stand with little understory vegetation has no nutritional value to these animals. Chaining and burning followed by reseeding would increase the number of animal unit months available to wildlife and horses, burros and livestock.

Spring developments would make water available to wildlife while still allowing livestock, horses and burros access. Water catchments, however, would be solely for wildlife use with livestock, horses and burros being excluded from the source by fences.

Wildlife input into allotment management plans and horse and burro plans may recommend reductions of the numbers of livestock, horses and burros allowed in certain areas. This, of course, in the short run would be detrimental to the certain number of animals chosen for removal. But, in the long run, a healthy population of livestock, horses and burros in harmony with their environment will result.

d. Ecological Interrelationships

The ecological interrelationships will be changed dramatically by the chaining/burning and reseeding actions. The change of the vegetative community from mature pinyon/juniper stands to a diversified grass, forbs and browse composition will affect ecological cycles, plant/animal and predator/prey interactions.

After the grasses, forbs and browse becomes reestablished, water runoff will be reduced. Rainfall will be more readily absorbed through the roots of the new plants. Instead of being completely transpired from trees, some water will be redirected through animals which consume the more succulent grasses, forbs and browse.

The burning will cause quicker recycling of plant nutrients.

Animal interrelationships will be altered as pinyon jays, mice and other animals adapted to mature pinyon/juniper communities move out and are replaced by other birds, mammals and reptiles which prefer the newly-created niches.

A greater variety of prey species will be available as succulent forage and new cover (downed trees make good dens) appears. New food sources will in turn attract more predator species. Raptors will probably utilize dead trees as perches. The intensified edge effect will also help improve hunting conditions for predators.

The water developments will complement these effects caused by chaining, burning and reseeding. New water sources will also help attract a wider variety of prey and predator species into areas previously off-limits because of water shortage.

d. Human Values

Landscape Character

The proposed actions will change the face of the landscape. The spring and water catchment developments would add permanent artifacts (troughs, pipelines, aprons, etc.) that could disrupt the undisturbed appearance of some areas.

Chaining and burning will immediately alter landscape character. At first burned or downed trees will litter large areas. See Photo #7. After vegetation has become reestablished, the areas of trees left standing interspersed with lush areas of grass and forbs will have a more pleasing aesthetic appearance.

However, poorly planned chaining, burning, and water developments could be detrimental to archeological sites. Such a loss would be irreversible.

Socio-Cultural Values

There are no identified historic sites which would be damaged by any of the proposed actions.

PHOTO #7: Effect of a burn on Landscape Character

Other adverse economic or social impacts include 1) loss of areas for pinyon nut collection, post cutting and Christmas tree gathering, 2) some public disapproval of "ugly" chaining or burning projects.

On the other hand, the proposed actions would have two major favorable impacts. First of all, habitat for livestock grazing would be improved. Grazing is an important economic activity in this WHA. Secondly, recreational opportunities would be increased. Improved wildlife habitat means improvement in the quality of hunting. Better hunting would benefit local people in 2 ways: 1) an increase in their own hunting pleasure 2) more revenue from the increased number of hunters passing through the two towns - Panaca and Caliente.

2. Possible Mitigating Measures

a. Non-Living Components

Air and Climate

Careful choice of time when chaining and burning will take place (time of lowest wind velocity; moist conditions for chaining, traveling, etc.) can reduce the amount of dust created by these operations.

Land

Soil tests should be made to determine best areas for burning or chaining. Mixing of concrete should be done in contained facilities to reduce the chance of soil pollution. Piles of downed trees left on the site will help reduce runoff of soil and water. If heavy vehicles used to transport men and equipment to project sites are restricted to existing roads, trails and washes, damage to fragile watershed areas will be kept to a minimum.

Areas of chainings or burns should be checked for mining claim markers prior to beginning the operation.

b. Living Components

Vegetation

Care should be taken during chaining to do as little damage as possible to valuable understory vegetation.

A mixture of browse, grass and forbs should be used to reseed the treated area.

Wildlife

Fences around waters should be constructed to wildlife specifications to allow easy access.

Patches of trees 10-15 acres in size scattered over the treated area will 1) preserve some habitat area for pinyon jays, pinyon mice and other species adapted to mature pinyon/juniper woodlands 2) maximize the edge effect and 3) leave areas of cover preserved for wildlife. See photo #8 for example of trees left standing within the Simpkins Chaining in Caliente.

Clean up of sites after construction of spring developments and water catchments should be quick and thorough, in order to encourage wildlife to return to the area as soon as possible.

Heavy vehicles carrying equipment and men should use existing roads, trails and washes to reduce damage to wildlife habitat in the vicinity of projects and to disturb the wildlife itself, as little as possible.

Livestock, Horses and Burros

Fencing the springs or guzzlers off solely for wildlife would be fatal to livestock, wild horses and burros. Provisions should be made for these animals, like piping water to separate troughs for them to use.

Total removal of livestock and horses would eliminate their competition with wildlife for water, forage and living space. But this would not be compatible with multiple use objectives or with the Wild Horse and Burro Act of 1971. Allotment Management Plans and Horse and Burro Plans should consider the habitat needs of all animals present and seek ways of satisfying their needs without overtaxing environmental resources.

c. Ecological Interrelationships

All the above mitigating measures would relieve some damage to ecological interrelationships caused by the proposed action.

PHOTO #8: Islands of trees left standing within the Simpkins Chaining.

d. Human Values

Landscape Character

Aprons of water catchments should be painted natural colors (pale beige, green or grey) to blend in with the surrounding environment. The sites should be thoroughly cleared of debris after construction is completed.

The aid of landscape architects should be solicited to design all chaining and burning projects. Treated areas should have irregular boundaries. Also, small areas of trees should be left standing to minimize the visual impact of opening up the formerly dense pinyon/juniper stands and to provide some shade and cover.

Socio-Cultural Values

Archeological surveys should be made of all proposed chaining or prescribed burning sites and water development areas in order to protect any possibly irreplaceable archeological values.

Known pinyon nut gathering areas should be excluded from treatment. Commercial and individual collections of Christmas trees, firewood and juniper posts should be concentrated in areas slated for habitat rehabilitations. Leaving some acres of trees standing within treatment areas will also help minimize post, firewood and Christmas tree loss.

It is important that the public be informed of proposed projects in this WHA. Many people misunderstand the purposes and benefits of pinyon and juniper tree removal. News releases, articles, slide shows, etc., should be developed and distributed to identify areas for rehabilitation and to describe the reasoning behind such actions and what the expected results will be.

3. Recommendations for Mitigation or Enhancement

All of the above mitigated measures are recommended.

4. Residual Impacts

Most of the temporary adverse impacts -- dust, temporary displacement of wildlife, littering of the landscape with

burned or downed trees after habitat rehabilitation projects, temporary exposure of treated areas to some erosion -- are unavoidable. Others -- like changes in ecological interrelationships, loss of potential Christmas trees, firewood and posts -- will last until pinyon and juniper trees reinvade the treated area (trees can begin to dominate a site again in 12-15 years).

5. Relationship between Short-Term Use and Long-Term Productivity

In the short run, most of the impacts of the proposed action will be detrimental to the environment: trees will be uprooted, large areas of burned stumps or piled debris will be visible, wildlife will be driven out of treatment areas or away from water sources, noise and dust will accompany construction of many projects, etc. But in the long run (starting in from 2-5 years after habitat rehabilitation and starting almost immediately after water developments are completed), the advantages of these actions will be great: production of grass, forbs and browse will increase, more water will become available, wildlife populations will increase and diversify, the quality of hunting in the area will improve, more water and forage will be available to livestock, horses and burros, etc. In the long run, the beneficial impacts far outweigh the adverse temporary impacts.

6. Irreversible and Irretrievable Commitment of Resources

If all the mitigating measures are instituted, the only irreversible and irretrievable commitment will be the loss of some pinyon and juniper trees and the reduction in numbers (or at least a change in distribution) of species adapted to the present conditions. These commitments will be small since islands of trees in the treatment area will remain untouched. These commitments will actually not be permanent either since new trees will eventually reinvade the treated area.

B. Environmental Impacts of the Alternatives

1. Alternative #1

One alternative to the proposed action is altering the implementation schedule. The plan, as it now exists, allows time for inventories and studies before projects are initiated and time for evaluation and maintenance of projects after they are completed.

Minor changes in the schedule, like constructing 3 catchments in the first year and 3 in the next (instead of 2 and 4) will not have an effect on the environment.

But major changes like rushing through projects or delaying them indefinitely will have adverse effects on the environment. Carrying out the projects without sufficient study may result in loss of archeological and aesthetic values, damage to fragile watersheds, inefficient chaining (which results in rapid reinvasion of trees) and a waste of time, money, effort and resources. Recommended mitigating measures would remain the same but there would be more residual adverse impacts and there would be a larger irreversible and irretrievable commitment of resources. The long-termed productivity would be reduced.

On the other hand, a long delay in implementing the proposed action may lead to a continuing deterioration of wildlife habitat. Without treatment, pinyon/juniper woodlands will probably get denser in the Beaver Dam WHA, water will remain scarce and the carrying capacity for a wide variety of wildlife species will decrease.

2. Alternative #2

No Action is another alternative to the proposed action. This would mean that no studies or inventories would be conducted, no water developments would be constructed, no springs developed and no chaining/burning/seeding actions would take place.

There would be no impact on air, climate, landscape character, or archeological and historical values, or wildlife adapted to pinyon/juniper vegetation.

But no action will allow pinyon/juniper woodlands to spread and get denser. Also water will remain scarce or unavailable. Unmanaged wild horses and burros populations will continue to grow rapidly. No information will be gathered on vegetation or wildlife habitat, and therefore, the wildlife program will have little input into allotment management plans or horse and burro plans.

The results of all this will include 1) increased loss of soil due to erosion 2) increased water runoff and flash flood potential 3) increased loss of forage-producing plants and the resulting loss of plant diversity and stability as well as loss of food for wildlife,

Minor changes in the schedule, like constructing 2 cascades in the first year and 3 in the second (instead of 2 and 4) will not have an effect on the environment.

But major changes like pushing through projects or delaying them indefinitely will have adverse effects on the environment. Carrying out the projects without sufficient study may result in loss of archeological and aesthetic values, damage to fragile watersheds, inefficient planting (which results in rapid deforestation of trees) and a waste of time, money, effort and resources. Recommended mitigating measures would remain the same but there would be more residual adverse impacts and there would be a larger irreversible and irretrievable commitment of resources. The long-termed productivity would be reduced.

On the other hand, a long delay in implementing the proposed action may lead to a continuing deterioration of wildlife habitat. Without treatment, pinyon/juniper woodlands will probably get denser in the Denver Dam WMA, water will remain scarce and the carrying capacity for a wide variety of wildlife species will decrease.

2. Alternative #2

To Solomon's another alternative to the proposed action. This would mean that no studies or investigations would be conducted, no water developments would be constructed, no cattings developed and no chaining/burning/seeding actions would take place.

There would be no impact on air, climate, landscape character, or archeological and historical values, or wildlife adapted to pinyon/juniper vegetation.

But no action will allow pinyon/juniper woodlands to spread and get denser. Also water will remain scarce or unavailable. Unmanaged wild horses and burros populations will continue to grow rapidly. No information will be gathered on vegetation or wildlife habitat, and therefore, the wildlife program will have little input into allotment management plans or the chain and burro plan.

The results of all this will include 1) increased loss of soil due to erosion 2) increased water runoff and flash flood potential, 3) increased loss of forage producing plants and the resulting loss of plant diversity and stability as well as loss of food for wildlife.

livestock and horses 4) increased competition among wildlife, horses and livestock for small quantities of water and decreasing forage 5) loss of habitat of endangered or protected species because little is known about their distribution or habitat requirements 6) damage to fragile watershed areas 7) loss of revenue as the livestock industry and quality of hunting decline. Some short-term adverse impacts (like dust or smoke, ugly burned stumps, etc.) would be avoided by taking no action but long-term productivity would be greatly reduced. The irreversible and irretrievable commitment of resources (particularly diversified vegetative and wildlife species) would be large if no action is taken in the Beaver Dam WHA.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

IV. Persons, Groups and Government Agencies Consulted

Nevada Department of Fish and Game
Fish and Wildlife Service

V. Intensity of Public Interest

Governmental agencies (BLM, NDF&G, FWS, etc.) sportsman and conservation groups and Lincoln County residents would all be interested in the actions proposed in the Beaver Dam Habitat Management Plan.

VI. Participating Staff

Robert Sulenski - Environmental Coordinator
Phillip V. Range - Caliente-Virgin Valley Area Manager
Richard Enriquez - Staff Wildlife Specialist
Terry Driver - Staff Range Conservationist
Frank Bingham - Chief, Division of Resource Management
James Gegen - Soil Scientist

VII. Summary

Analysis of the proposed action and alternatives indicates that the Beaver Dam Habitat Management Plan will have some temporary adverse impacts on the environment (creation of dust or smoke, displeasing aesthetics, temporary displacement of wildlife, etc.) but that the long-run impacts are favorable for vegetation, wildlife and human resources.

9/2/75 — Date
Denise P. Meridith — Denise P. Meridith, Environmental Specialist

I concur:

9/8/75 — Date
Robert J Sulenski — Robert Sulenski, Environ. Coordinator

9/8/75 — Date
Phillip V. Range — Phillip Range, Area Manager

9/4/75 — Date
Frank Bingham — Frank Bingham, Chief, Resource Management

9/26/75 — Date
John S. Boyles — John S. Boyles, District Manager

VIII. References

Brunner, J., 1974. Environmental Analysis Record: Delamar Valley Allotment Management Plans. Bureau of Land Management. Las Vegas. 92 pp.

Bureau of Land Management, 1973. Caliente Unit Resource Analysis and Management Framework Plan. USDI: BLM, Las Vegas, Nevada.

_____, 1974. Economic Supplement - Las Vegas District. USDI: BLM. Reno, Nevada. 174 pp.

Meridith, D., 1975. Beaver Dam Intensive Inventory and Habitat Management Plan (Revision). Bureau of Land Management, Las Vegas, Nevada.

Rush, 1964. Ground Water Appraisal of Meadow Valley Area (Report 27) Department of Conservation and Natural Resources. Carson City, Nevada. 43 pp.

Tansch, R., 1972. Plant Succession and Mule Deer Utilization on Pinyon/Juniper Chainings in Nevada (Masters Thesis). University of Nevada, Las Vegas, Nevada.

United States Forest Service, 1973. Draft Environmental Statement: Pinyon-Juniper Chaining Program on National Forest Lands in the State of Nevada. U. S. Department of Agriculture: U. S. Forest Service. Ogden, Utah. 58 pp.

United States Geological Survey, 1974. Water Resources Data for Nevada. U. S. Department of the Interior: U. S. Geological Survey. Carson City, Nevada. 244 pp.

Willie & al., 1975. Preliminary Lincoln County Master Plan. Lincoln County Commission. Pioche, Nevada. 47 pp.

A P P E N D I X

Meridith, 1975

Caliente MFP Step III Decisions Affecting The Beaver Dam WHA

Recreation

1. Where feasible, game populations will be increased in the Clover Mountains. Roads in this area will be maintained regularly to facilitate hunter access. Public access across national resource lands will be maintained.

2. In the Meadow Valley Wash area, identify and obtain access routes across private lands where such access is limited. Wherever possible, present upland bird populations will be improved.

3. Maintain access into Clover Mountains where wild horses or burros may be viewed. Where practical, water developments within these areas will be constructed to facilitate recreational observation of wild horses and burros.

4. All developments or operations within the Clover Mountains will consider aesthetic values (buffer zones will be provided around chainings, seedings and sprayings where they may be viewed from any existing transportation route).

Minerals

1. Small areas around crucial wildlife habitat areas and water sources should be withdrawn from the general mining laws subject to valid and existing rights.

2. Mineral and energy sources will contain surface protection stipulations for the protection of other resources, especially fragile watershed, wildlife and recreational values.

3. Exploration for geothermal energy sources will be encouraged. Prior to issuance of a permit or lease for geothermal exploration or development, a thorough examination will be made to determine if conflicts exist with other resources.

Wild Horses and Burros

1. Inventory wild horse and burro populations and determine allotments where they are found.

2. Determine the allowable numbers of wild horses and burros in each habitat area to maintain the ecological balance and prevent environmental degradation.

3. In areas of known wild horse and burro use, fences will be carefully planned so movement of horses are not necessarily restricted.

Meridith, 1975

4. Develop Wild Horse Management Plan for wild horse selected problem areas. Manage wild horses in place as one component of the ecosystem. Priority allotment areas include: Little Mountain, Rabbit Spring, Sheep Spring, Oak Wells, Buckboard, Cottonwood, Pennsylvania, Sawmill-Clover Mountain, Clover Creek, and Mustang Flat.

Watershed

1. Priority watersheds for chemical or mechanical vegetation manipulation are Sheep Spring, Rabbit Spring, Oak Wells and Little Mountain.

2. Other priority watersheds for mechanical vegetation manipulation include Buckboard, Pennsylvania and Cottonwood.

3. Improve watershed cover and conditions in the Beaver Dam watershed (a fragile watershed) by restricting uses which disturb the soil and vegetative cover.

4. Watershed intensive analysis and activity planning will be initiated based on the following multiple used priorities. East Panaca Geographic Area, Pennsylvania watershed.

5. Improve and maintain water and environmental quality by reducing excess silts in high runoff water flows in Clover Creek, Meadow Valley Wash and Beaver Dam Creek by improving watershed cover conditions. Develop Watershed Management Plans with priority on the East Panaca Geographical Area.

6. Reduce chemical pollution at water sources and improve environmental quality by fencing livestock away from water sources and piping water to a suitable drinking trough. Place bird ladders in troughs.

7. Protect the following watershed improvements from wildfire: Sheep Flat, Barclay summer and Enterprise seedings and the Staheli and Simpkins chainings. Rehabilitate wildfire areas immediately.

Lands

1. If suitable land exchange can be arranged, acquire those private lands containing archeological sites located along the Meadow Valley Wash Road six miles south of Caliente.

Meridith, 1975

Forestry

1. Investigate the possibility of establishing a Christmas tree farm on the Sheep Spring chaining.

2. Concentrate forest product sales in areas proposed for chaining.

Livestock

1. Continue implementation and/or maintenance of Allotment Management Plans on Mustang, Oak Springs, and Barclay Summer allotments.

2. Develop and maintain AMPs on all allotments. Priority will be on the allotments which can be improved through livestock management alone: Crossroads, Sheep Spring, Enterprise and Barclay Winter allotments.

3. Use mechanical and/or chemical treatment or fire to reduce woody competition and to permit growth of good forage plants on those areas which have been identified through Allotment Management Planning.

4. Livestock waters will remain functioning throughout the year for use by wildlife.

5. Water troughs will be equipped with bird ladders or other devices to facilitate small animal use.

6. Reclassify the Little Mountain Allotment for cattle use only.

7. When possible, construct all fences in important big game areas to wildlife specifications.

Wildlife

1. Conduct studies to identify crucial mountain lion habitat areas. Consider mountain lions in all Habitat Management Plans.

2. Inventory and protect crucial small game and non-game habitat.

3. Conduct inventory to determine habitat areas of threatened and protected species. Develop special management plans.

4. Intensive inventories will be made of Ash, Pine and Cottonwood Creeks.

5. Wildlife specialist will work closely with Range Specialist in developing Allotment Management Plans for those allotments involving crucial wildlife habitat.

6. Cooperate in the development of wild horse and burro management plans.

7. Construct big game catchments identified in Habitat Management Plans.

8. Develop new waters for quail, dove, chukar, cottontails and non-game use in the Clover Mountains.

9. Control burn portions of the south slope of Sawmill Range (see Management Framework Plan overlays).

10. Mineral examinations will be made of crucial wildlife areas to identify potential conflicts.

11. Maintain or improve riparian vegetation along Meadow Valley Wash and Clover Creek.

12. Leave unchained patches of pinyon/juniper of 10 to 15 acres for every 100 treated. Design projects in irregular shapes to increase edge effect and maintain treated areas as close to cover as possible.

13. Develop additional summer habitat through chaining and seeding projects.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ANALYSIS WORKSHEET

1. Action

Implementation of Beaver Dam HMP

2. Stages of implementation

Spring & Water Catchment Developments

3. DISCRETE OPERATIONS	Movement of men & materials to site	Construction	Fencing	Clean-up & leaving	Aftermath	4. COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	5. ANTICIPATED IMPACTS					6. REMARKS
I. NONLIVING COMPONENTS						A. AIR						
						Air Quality						
						Dust (particulates)	+L	+L	0	+L		A slight degradation of air quality will result because of dust & exhaust emissions from vehicles & equipment used in construction
						Chemicals (CO, SxO)	+L	+L	0	+L		
						B. LAND						
						Soil Pollution	0	0	0	0	0	Minor erosion may result from clearing small site for development & from vehicles used on fragile watershed areas.
						Erosion Potential	+L	+L	0	+L	0	
						Flood Hazard	0	0	0	0	0	
						C. WATER						
						Water Supply	-L	-L	0	-L	+H	Water may be made unavailable during construction but in long run supply will increase
						Contamination						
						(Animal Waste)	0	0	-H	0	-H	Fencing will eliminate contamination by livestock, horses & burros. Some chem. & sediment may accidently pollute water during construction.
						(Chemicals)	0	+L	0	0		
						(sediment Load)	0	+L	-L	0	-L	
II. LIVING COMPONENTS						A. PLANTS (*Aquatic*)						
						N/A						

(Continued on reverse)

DISCRETE OPERATIONS	Movement of men & materials to site	Construction	Fencing	Clean up & leaving	Aftermath	
COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	ANTICIPATED IMPACTS					REMARKS
II. LIVING COMPONENTS (Con.) B. PLANTS (Terrestrial)						
Grass	-L	-L	+M	0	+L	Some vegetation may be destroyed during transportation and construction. But fencing will protect reestablished vegetation within enclosures.
Forbs	-L	-L	+M	0	+L	
Conifer	-L	-L	0	0	+L	
Brush & shrubs	-L	-L	+M	0	+L	
C. ANIMALS (Aquatic) N/A						
D. ANIMALS (Terrestrial)						
Mammals (wildlife)	-M	-M	+M	-L	+H	Animals may be temporarily displaced by noise & movement of men & machines. In long run all animals, but particularly wildlife (now crowded out by some cows, horses & burros) will benefit from increased water.
Birds	-M	-M	+M	-L	+H	
Reptiles	-L	-L	+M	-L	+M	
Livestock	-M	-M	-L	-L	+M	
Invertebrates	-L	-L	+M	-L	+H	
Horses & Burros	-M	-M	-L	-L	+M	
III. INTERRELATIONSHIPS A. ECOLOGICAL PROCESSES						
Nutrient cycle	0	-L	0	0	+M	Cycles may be temporarily disturbed as wildlife & vegetation are disturbed, but after completion of project ecological processes will be benefited.
Hydrologic "	0	-L	0	0	+H	
Predator/prey relat.	-L	-L	-L	-L	+H	
IV. HUMAN VALUES A. LANDSCAPE CHARACTER						
Visual Impact	-L	-M	-L	-L	-L	Noise disturbance will be temporary. But the spring devi or catchment will slightly disrupt the desert landscape.
Sound	-L	-M	0	-L	0	
B. SOCIOCULTURAL INTERESTS						
Archeological Values	-L	-M	-L	-L	-M	Some arch. values may be lost.
Socio-Economic Values	+L	+L	0	+L	+M	Econ. will benefit from work force and increased hunter trade in the future.
Cultural	0	0	0	0	0	

INSTRUCTIONS

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   c. Assumptions may be made to establish a base for analysis *(e.g. estimated time periods, season of year, etc.)*.
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3. *Discrete Operations* – Identify separate actions comprising a particular stage of implementation *(e.g. the construction stage of the road project has the discrete operations of clearing, grading, and surfacing)*.
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5. *Anticipated Impact* – Evaluate anticipated impact on each element and place an entry in the appropriate square indicating degree of impact as low (L), medium (M), high (H), no impact (O), or unknown or negligable (X). Preceed each entry by a plus (+) or minus (–) sign indicating a beneficial or adverse type of impact. If type of impact reflects a matter of opinion or is not known, *do not* preceed with a sign. For example, construction of a wind mill on open range has a definite visual impact; *however*, to some people the effect is detrimental while to others it is an improvement. By not entering a plus (+) or minus (–) sign the worksheet is kept factual and unbiased. If both degree and type of impact are unknown, place an (x) in the appropriate square.
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6. *Remarks* – Enter clarifying information.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ANALYSIS WORKSHEET

1. Action: Implementation of Beaver Dam HMP

2. Stages of implementation: Habitat Treatments (Chaining or prescribed burning)

3. DISCRETE OPERATIONS: Pretreatment survey; Chaining or burning; Reseeding; Reestablishment of vegetation

4. COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	5. ANTICIPATED IMPACTS					6. REMARKS
I. NONLIVING COMPONENTS						
A. AIR						
Air Quality						Dust and exhaust emissions
Dust (Particulate)	+L	+M	+L	0		will result from the
Chemicals (co, etc)	+L	+M	0	0		vehicles & machinery used
B. LAND						
Soil Pollution	0	+L	0	-M		Run-off will occur as land is
Erosion Potential	+L	+M	0	-H		cleared and churned up. But once
						vegetation is reestablished,
						erosion and flood hazard
						will be greatly reduced.
Flood Hazard	0	+M	0	-H		
C. WATER						
Water Supply Contamination	0	0	0	0		Some chemicals & sediments
Animal Waste	0	0	0	0		may enter water supplies
Chemicals	0	+L	0	-L		as earth is churned
Sediment	0	+M	0	-L		up and run-off occurs. But
						after vegetation becomes
						reestablished this sort of
						contamination is a lot
						less likely
II. LIVING COMPONENTS						
A. PLANTS *(Aquatic)*						
N/A						

(Continued on reverse)

DISCRETE OPERATIONS	Pre-treatment surveys	Chaining or burning	Reseeding	Reestablishment of vegetation		
COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	**ANTICIPATED IMPACTS**					**REMARKS**
II. LIVING COMPONENTS (Con.)						
B. PLANTS *(Terrestrial)*						
Grass	O	-L	+H	+H		Chaining or burning will seriously thin out pinyon/juniper and reseeding will allow grasses, forbs & browse to become reestablished
Forbs	O	-L	+H	+H		
Conifers	O	-H	O	+L		
Brush & shrubs	O	-L	+H	+H		
C. ANIMALS *(Aquatic)*						
N/A						
D. ANIMALS *(Terrestrial)*						
Mammals (wildlife)	-L	-M	O	+H		Animals will be initially displaced from the area chained or burned or by men & vehicles studying the area. But once grass, forbs & grass return, most animals will benefit
Birds	-L	-M	+M	+H		
Reptiles	-L	-M	+L	+H		
Livestock	-L	-M	O	+H		
Horses & Burros	-L	-M	O	+H		
Invertebrates	-L	-M	+L	+H		
III. INTERRELATIONSHIPS						
A. ECOLOGICAL PROCESSES						
Nutrient cycle	O	+M	+L	+H		Chaining & burning will quickly return nutrients to soil & increased number of plants & animals after vegetation is established will stimulate nutrient, hydrologic & food cycles
Hydrologic cycle	O	O	O	+M		
Food chain	O	-M	+L	+M		
IV. HUMAN VALUES						
A. LANDSCAPE CHARACTER						At first burning or chaining will have great adverse impact on landscape appearance.
Visual Impact	O	-H	O	+H		
Sound	+L	+L	+L	O		Noise will be prevalent temporarily during the operation.
B. SOCIOCULTURAL INTERESTS						As vegetation returns, landscape character will improve.
Archeological Values	-X	X	X	X		Chaining, burning & revegetation may obscure or destroy archeol. sites, or traditional pinyon-gathering areas not yet identified.
Socio-Economic Values	X	X	X	X		
Cultural	O	X	O	O		

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ANALYSIS WORKSHEET

1. Action: No Action

2. Stages of implementation:

3. DISCRETE OPERATIONS

4. COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	5. ANTICIPATED IMPACTS	6. REMARKS
I. NONLIVING COMPONENTS		
A. AIR		
Climate	O	
Air Quality		
Dust	O	
Chemicals	O	
B. LAND		
Soil Pollution	O	If pinyon/juniper woodlands get denser, erosion and flood hazards will increase due to increasing lack of understory vegetation.
Erosion Potential	+H	
Flood Hazards	+H	
C. WATER		
Water Supply	-M	With no improvements water quantity will stay low or decrease.
Contamination (Animal Waste)	+M	Uncontrolled livestock, horses & burros will continue to muddy & contaminate water sources.
(Chemicals)	+L	
(Sediment Load)	+M	Chemicals & sediments will continue to pollute water as erosion & flood hazards increase
II. LIVING COMPONENTS		
A. PLANTS (*Aquatic*)		
N/A		

(Continued on reverse)

DISCRETE OPERATIONS

COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	ANTICIPATED IMPACTS					REMARKS
II. LIVING COMPONENTS (Con.)						
B. PLANTS *(Terrestrial)*						
Grass	-H					With no chaining or burning to thin woodlands, P/J will continue to crowd out grass, forbs, brush & shrubs.
Forbs	-H					
Conifers	+H					
Brush & Shrubs	-M					
C. ANIMALS *(Aquatic)*						
N/A						
D. ANIMALS *(Terrestrial)*						
Mammals (Wildlife)	-H					With no improvements, habitat (forage & water) will deteriorate to the disadvantage of most animals.
Livestock	-M					
Horses & Burros	-M					
Birds	-M					
Reptiles	-L					
Invertebrates	-L					
III. INTERRELATIONSHIPS						
A. ECOLOGICAL PROCESSES						
Nutrient cycle	-M					As habitat deteriorates, ecological processes are disrupted or altered.
Hydrological "	-M					
Pred/prey relationship	-M					
IV. HUMAN VALUES						
A. LANDSCAPE CHARACTER						
Visual Impact	O					
Sound	O					
B. SOCIOCULTURAL INTERESTS						
Archeol. Values	O					
Socio-Economic	O					
Cultural	O					

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II. LIVING COMPONENTS	D. ANIMALS (*Terrestrial*)						
	Mammals (Wildlife)	-H					With no improvements, habitat (forage & water) will deteriorate to the disadvantage of most animals.
	Livestock	-M					
	Horses & Burros	-M					
	Birds	-M					
	Reptiles	-L					
	Invertebrates	-L					
III. INTERRELATIONSHIPS	A. ECOLOGICAL PROCESSES						
	Nutrient cycle	-M					As habitat deteriorates, ecological processes are disrupted or altered.
	Hydrological "	-M					
	Pred/prey relationship	-M					
IV. HUMAN VALUES	A. LANDSCAPE CHARACTER						
	Visual Impact	O					
	Sound	O					
	B. SOCIOCULTURAL INTERESTS						
	Archeol. Values	O					
	Socio-Economic	O					
	Cultural	O					

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2. *Stages of Implementation* – Identify different phases of proposed project *(e.g. a road project consists of survey, construction, use, and maintenance stages).*
3. *Discrete Operations* – Identify separate actions comprising a particular stage of implementation *(e.g. the construction stage of the road project has the discrete operations of clearing, grading, and surfacing).*
4. *Elements Impacted* – Enter under appropriate heading all environmental elements susceptible to impact from action and alternatives. Relevant elements not contained in the digest should also be entered. See BLM Manual 1791, Appendix 2, Environmental Digest.
5. *Anticipated Impact* – Evaluate anticipated impact on each element and place an entry in the appropriate square indicating degree of impact as low (L), medium (M), high (H), no impact (O), or unknown or negligable (X). Preceed each entry by a plus (+) or minus (–) sign indicating a beneficial or adverse type of impact. If type of impact reflects a matter of opinion or is not known, *do not* preceed with a sign. For example, construction of a wind mill on open range has a definite visual impact; *however,* to some people the effect is detrimental while to others it is an improvement. By not entering a plus (+) or minus (–) sign the worksheet is kept factual and unbiased. If both degree and type of impact are unknown, place an (x) in the appropriate square.
   a. The measures of impact *(e.g. low, medium, and high)* are relative and their meaning may vary slightly from action to action. The term *"low"* should not be applied to impacts of a negligible nature. For example, we know that a pickup truck driving down a proposed fence line laying wire has some impact on air quality. However, the significance of this impact is not normally great enough to warrant even a *"low"* rating. In cases like this, the impact will usually be marked *"O"* or the element left off the worksheet.
   b. It is recognized that some environmental elements may defy accurate measurement or in-depth analysis within current Bureau capabilities or expertise. The nature of the action as well as type and degree of impact should guide in the decision to seek outside expertise or assistance.
6. *Remarks* – Enter clarifying information.

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